Real-Time Estimates of Arsenic, Antimony, and Mercury Concentrations in the East Fork of the South Fork of the Salmon River above Sugar Creek near the Stibnite Mining Area of Central Idaho

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The U.S. Geological Survey (USGS) has operated a network of 5 streamflow gaging stations in the Stibnite mining area near Yellow Pine, Idaho since September 2011, in cooperation with the Idaho Department of Lands and Midas Gold Corporation. Streamgages were located to evaluate trace-metal loading and transport in the East Fork of the South Fork of the Salmon River (EFSFSR). A recently published report summarizes results of water-quality models used to assess constituent loading in discrete reaches of the EFSFSR.

One type of water-quality model uses continuous values of specific conductance and/or streamflow as surrogates to estimate concentrations of dissolved arsenic, dissolved antimony, and total mercury in the EFSFSR above Sugar Creek. With peer-reviewed, published surrogate model results, USGS uses values of specific conductance and/or streamflow transmitted from sensors deployed at its streamgage to estimate constituent concentrations in real time. Computed streamflow is also used to convert estimated concentrations into estimated loads. Estimated constituent concentrations and loads are served at an hourly time-step on the USGS National Real-Time Water Quality (NRTWQ) website (http://nrtwq.usgs.gov/).

Time-series estimates of constituent concentrations and loads are essential to assessing compliance with multi-day average and instantaneous regulatory criteria. The probability of exceedance of any given regulatory criterion associated with concentration or load is also estimated at an hourly time-step to include estimates of the potential error of each estimated concentration and load. Probability-of-exceedance values provided in real time on NRTWQ help managers optimize sampling efforts and reduce sampling costs.